# GEOGRAPHIC SCHOOL BULLETINS

*Published Weekly by*

THE NATIONAL GEOGRAPHIC SOCIETY

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## Contents for Week of January 12, 1942. Vol. XX. No. 25.

1. Luzon, Largest of the Philippines
2. Martinique: A French Storm Center of the Caribbean
3. Chemical Clothing from Head to Foot
4. Wake Island, The New Watchword for Valor
5. Overloaded Hong Kong Was Vulnerable to Siege

*Photograph by J. Baylor Roberts*

**SHOULDER TO SHOULDER WITH THE U. S. ARMY, FILIPINOS ENTERED THE BATTLE FOR THE PHILIPPINES**

**At the Philippines' summer capital, Baguio, on a plateau in the highlands where bracing mountain air and pine trees make a contrast with the tropical lowlands around Manila, Filipino cadets have been trained for the Army at their version of the U. S. Military Academy at West Point. These cadets were photographed holding the dummy guns with which they drilled. When the Japanese invaded Luzon, Filipino forces fought beside the U. S. Army for the most important island of the Philippines (Bulletin No. 1).**

### HOW TEACHERS MAY OBTAIN THE BULLETINS

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UMI

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**General Headquarters, Washington, D. C.**


## Luzon, Largest of the Philippines

IN PICKING Luzon for their first concentrated attack on the Philippines, the Japanese selected the largest, richest, and best fortified unit of that island group.

Luzon is the northern of the pair of big islands between which most of the 7,000 smaller Philippine Islands lie. Its mountainous, volcanic core and surrounding narrow shelf of coastal lowlands have an aggregate area of 40,814 square miles —the size of the State of Virginia. The island's population is nearly as great as that of the rest of the Philippines together.

### Within 220 Miles of Japanese Territory

Luzon lies only 220 miles south of Taiwan, Japan's island colony. French Indo-China, where Japanese bases have been established, is 800 miles to the west. The strong British base of Singapore is nearly twice as far away, 1,500 miles to the southwest. The nearest American stronghold, with the exception of Guam, is Honolulu in the Hawaiian Islands, 4,700 miles east.

American army and navy bases on Luzon, clustered around Manila for the most part, represent investments of millions of dollars—Cavite, Corregidor, Nichols Field, and Olongapo. In the old Spanish Fort San Felipe at Cavite is preserved the flagstaff on which the American flag was first hoisted in the Philippines, on the morning of May 3, 1898, by Commodore Dewey of the U. S. Navy. In addition to American fighting forces, Filipinos, trained in their own "West Point" at Baguio, entered the fight for their island (illustration, cover).

The capital, largest city, and principal port of the Philippines is Manila, on the west coast of Luzon. The city spreads along the eastern shore of Manila Bay at the mouth of the muddy Pasig River. On the river's left bank stands the old Spanish-built Walled City, extensively damaged by Japanese bombs.

### Manila Primarily an American City

Of Manila's 623,000 inhabitants, only a small fraction are Americans. Yet, it has been primarily an American city, with American automobiles, street cars, movies, billboards, neon lights, and with merchandise from the U. S. A. Until 1898, when Admiral Dewey arrived, Manila was a Spanish colonial town, featuring Spanish churches, palaces, costumes, and customs. In Manila streets, automobiles still must compete with the old-fashioned carabao carts and the horse-drawn two-wheeled *carromatas*.

The ship-lined Pasig River divides the old Walled City from the busy wholesale, warehouse, banking, and shipping district of the modern town. South of the Walled City, on "made" land, were built clubs, hotels, playgrounds, piers, and government offices, presenting a silhouette familiar to American eyes.

The mountainous east coast of Luzon, battered by the Pacific, is walled in by the Sierra Madre Mountains. But the west coast is indented with numerous bays of great military importance, notably Lingayen Gulf, which reaches 30 miles inland from a 20-mile-wide entrance. The most vital is Manila Bay, chosen by Americans and their predecessors in the Philippines, the Spaniards, as a naval stronghold. All the approaches from other American bases in the Pacific to these west coast bays are narrow straits exposed to Japanese-held islands.

Luzon is chiefly agricultural, producing tobacco on the northern coast, rice in the central regions, and some Manila hemp (or abacá fiber, essential for ropes)



UMI

*Photograph by Maj. A. W. Stevens*

**IN MARTINIQUE, VOLCANOES BUILD AND VOLCANOES DESTROY**

**The entire French island is of volcanic origin, and layers of crumbling lava have endowed it with the fertile soil to which its agricultural prosperity is due. Mount Pelée, rising into the clouds 4,428 feet above sea level (background), is a symbol of volcanic destructiveness. In 1902 it poured a flaming cascade of lava down the island's slopes into the sea, and wiped out the entire thriving city of St. Pierre with the loss of 40,000 lives. The lava streams, now rivers of solid rock, are still visible snaking down the valleys and across the beaches into the Caribbean (Bulletin No. 2).**

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## Martinique: A French Storm Center of the Caribbean

THE agreement at the end of 1941 that assured friendly relations between the United States and the French island colony of Martinique, in the West Indies, quieted some troubled waters in the Caribbean. The island stands in that curving West Indies chain that separates the Atlantic Ocean from the Caribbean Sea, in a position to aid or threaten the outlying defenses of the Panama Canal.

The peaceable settlement of the Martinique problem was especially welcome in view of the difficulties that developed over St. Pierre and Miquelon, the tiny French-owned islands off the east coast of Canada.

Close to Martinique are two of the United States naval bases leased from Great Britain in 1940. One is on the little island of Antigua, 150 miles northwest, and the other is on St. Lucia, scarcely 25 miles south. The Panama Canal, for which these bases are outposts, is about 1,350 miles west and slightly south.

### Volcanoes and Humidity Make It "Hot Spot"

Martinique is the southernmost of France's West Indies possessions. Between it and the French island of Guadeloupe, on the north, lies the British colony of Dominica. Surrounding Guadeloupe are several tiny French island dependencies. More than 100 miles northwest, France owns the island of St. Barthélemy and shares St. Martin with the Netherlands.

Martinique, whose volcanic slopes are clothed with tropical greenery, has northern and western coasts that are bold and forbidding. The irregular southern and eastern shores are lower, but in places are even more dangerous. Coral reefs and islets rise offshore to the east. Scattered beaches around the island are backed by volcanic mountains, whose cratered summits sometimes are obscured by clouds. Highest peak in the north is Mt. Pelée, the 4,428-foot volcano which erupted suddenly in 1902 and wiped out the city of St. Pierre (illustration, inside cover).

The battlement-studded harbor at Fort-de-France, Martinique's capital, forms a ready-made naval station about midway between Puerto Rico and Trinidad. It has one of the best harbors in the Lesser Antilles, well-dredged and capable of sheltering a large flotilla. It lies on the western or Caribbean side of the island. Mountains screen its piers, cranes, and drydock from the sea.

The volcanic French colony is a literal "hot spot" of the Caribbean, where sea breezes keep the heat in most of the other islands from becoming oppressive. On the coast the mean annual temperature is 80 degrees Fahrenheit. Here is another case of the old complaint, "It isn't so much the heat; it's the humidity." From June to October the day is rare when no rain falls.

### Made Self-Supporting by Fish and Sugar

Martinique is a little island with a large population. Only 40 miles long and 21 miles across at the widest point, its area is 385 square miles. However, it holds about a quarter of a million persons. Most of them are Negroes, mulattoes, or a mixture of African and Carib Indian blood. The natives speak a French patois.

Unlike most French West Indies islands, Martinique has not needed to depend on tourists for prosperity. The bulk of the people are fishermen or plantation workers, and normally the island is self-supporting. Since the fall of France and a decrease in trade, however, it has suffered economically. The major portion of its income has been derived from sugar and its by-product, rum. Sugar, rum,



UMI

in the southeast. The magnificent rice terraces of central Luzon, built by Ifugao tribesmen before the coming of the first white men, are still an agricultural wonder.

Gold mining, iron mining, and lumbering on the island's extensive timber lands are other important industries. A deposit of chromite, the ore from which chromium is extracted for use in steel, has been reserved for United States use.

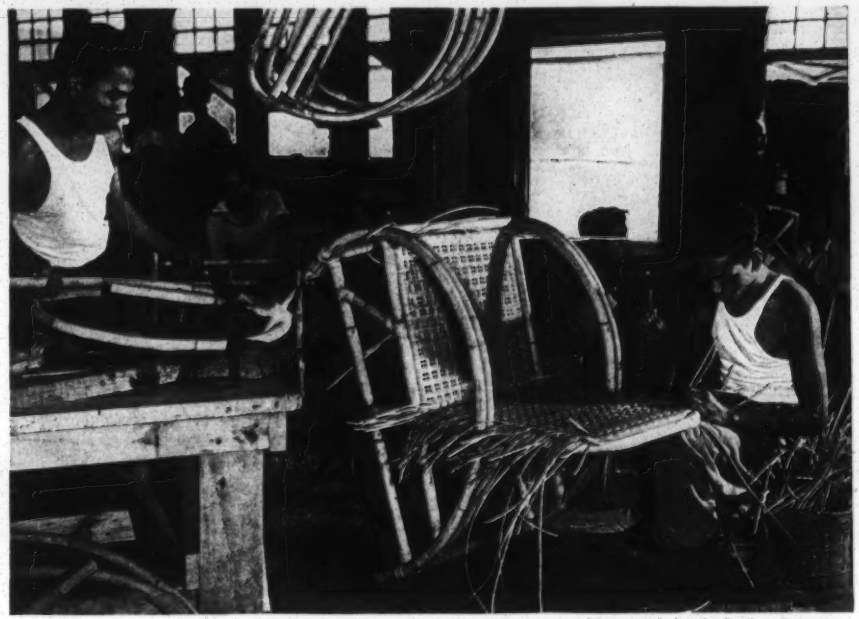
While Luzon's Ifugao tribesmen still eat fried locusts and Igorot mountaineers recall their head-hunting exploits, the island is the site of one of the most American spots in the entire Orient. It is Baguio, the "summer capital" of the Philippines, where practically all officials have their summer homes. Baguio lies on a plateau only 150 miles north of Manila in the mountains, where mile-high altitude gives it a temperate climate, never warmer than 75 degrees and frequently cold enough for frost. William Howard Taft, then Governor of the Islands, in 1903 called Baguio the Adirondacks of the Philippines.

Note: The National Geographic Society's Map of the Indian Ocean, published as a supplement to the issue of the *National Geographic Magazine*, March, 1941, shows the position of the Philippine Islands in their relation to Japan, the mainland of Asia, the Malay States, and the Netherlands Indies. This map may be obtained from the headquarters of the Society in Washington, D. C.

For further information about Luzon, see "Return to Manila," in the *National Geographic Magazine*, October, 1940, and "The Unexplored Philippines from the Air," September, 1930.

See also the following GEOGRAPHIC SCHOOL BULLETINS: "Strategic Materials: No. 10, Coconut Waste That Saves Lives," November 10, 1941; "Strategic Materials: No. 4, Manila Rope Ties in with Defense," April 28, 1941; and "U. S. Bases in Pacific: From Philippines to Alaska and the Canal Zone," November 18, 1940.

**Bulletin No. 1, January 12, 1942.**



*Photograph by J. Baylor Roberts*

**IN HOT MANILA WORKSHOPS, COOL RATTAN CHAIRS ARE MADE**

**One of the principal industries of Manila, the capital and chief port of the Philippines, is the manufacture of the lightweight wicker furniture so popular in the tropics—smooth and cool to the touch, open in construction to allow each vagrant breeze to reach the occupant. Bamboo, the long stems of the rattan palm, cane, and bent wood enter into the construction. One workman (left foreground) bends the framework for the arms and legs, others (background, left and extreme right) bind the frame together. The patient youth with the basket of cane (right foreground) weaves the cane bottom and then the back. From Manila the furniture is shipped to countries around the world, about $150,000 worth reaching the United States in normal times.**

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## Chemical Clothing from Head to Foot

WITH silk needed for parachutes, wool for army overcoats, and leather for army boots, the civilian is looking more and more to chemistry for clothing.

In the 1942 chemical wardrobe are "wool" from milk, "silk" from wood pulp and cotton linters, jewelry from the resinous by-products of petroleum refineries, and "leather" from various substances combined in the magical test tube. Even glass is used in fabrics for neckties and dresses, and as cushioning in shoe soles.

### Can Dress in Seaweed or Milk

A synthetic is an artificial substitute for some similar material found in nature, such as silk, wool, ivory, rubber, or skins. The primary "building blocks" of which our modern laboratory Merlins concoct these chemical miracles are carbon, water, and air, the basic ingredients of the so-called organic substances of animal or plant origin, such as leather and silk.

Other countries have already become synthetic-wise for the purpose of economizing on natural materials. Italy makes large use of "Lanital," a cloth that is half wool and half casein made from milk. During the depression of the 1930's, Japan recovered from heavy losses in her silk trade by becoming one of the world's leading rayon producers. Now Japan is said to have a new textile made of seaweed. Germany has been depending on synthetic materials for years.

The modern man, and particularly the modern woman, can dress comfortably and smartly without a shred of real silk, wool, linen, cotton, or leather, and without genuine jewels for decoration. Synthetic styles can provide the American girl with a hat of cellophane, dress, underwear, and gloves of rayon, nylon stockings, "alligator" slippers of rayon coated with a laboratory "magic" material called pyroxylin. Her "jade" bracelets or "ivory" beads would look like the real thing. Her artificial leather handbag probably would have a plastic frame. Synthetic musk could perfume her artificial silk handkerchief. Raincoat and umbrella of the cellophane-like plastic of the "vinyl ester" family can protect her from a storm.

### Rayon Is King of Artificial Fibers

Rayon, made of wood pulp or cotton linters, is the "big boy" of artificial fabric materials (illustration, next page). Now that the government has shut down on processing of silk for non-defense uses, rayon is enjoying even greater popularity. Last year, the United States used almost eleven times as much rayon yarn as real silk for purposes that formerly demanded raw silk. Rayon filament yarn (long strands for spinning) production was 388,729,000 pounds.

In addition, as a substitute for wool and linen in suits, dresses, and upholstery, this country used over 99,000,000 pounds of staple fiber rayon (rayon cut in much shorter strands than those of rayon filament yarn). United States rayon production in 1940 was surpassed slightly by Japan's and considerably by Germany's.

Rayon can be made fine as silk or coarse as horsehair. A filament a thousand miles long may weigh but a pound. It can be given any desired luster. Moths won't touch it. Heavy, oblong strands of rayon, which look and act like straw, are formed into "straw" hats that will survive a thunder shower soaking better than the real thing. Transparent velvet did not exist until rayon came along. Hosiery, underwear, frocks and dresses consume vast quantities of rayon. Much artificial leather is made of specially prepared rayon. It is pushing wool and fur



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bananas, and pineapples made up more than 98 per cent of the island's exports in 1938. Coffee, cocoa, vanilla, and tobacco are produced in smaller quantities.

The only railroads on Martinique are on sugar cane plantations, but most of the roads are good. Bullock carts often are forced to the side by automobiles, whose native drivers regard constant use of the horn as the best means of preventing accidents.

### France in the Tropics

For most natives, walking is the usual form of transportation. To bring produce to market at Fort-de-France, women often walk 20 or 30 miles, gracefully bearing 100-pound loads on their heads. They are striking figures in voluminous calico dresses and gaudy turbans of scarlet, orange, or brilliant blue.

Fort-de-France, a city of some 50,000 people, is a mixture of France and the tropics. The cafés are typically French, but the streets are lined with palms, and the brightly painted houses have iron balconies and green shades. Three forts help protect the harbor. On the waterfront is a palm-fringed park, the Savane, where stands a statue of Josephine, the unhappy wife of Napoleon, who was born in Martinique.

Note: Martinique may be located on the Map of Mexico, Central America, and the West Indies, published by the National Geographic Society. This map may be obtained from the headquarters of the Society in Washington, D. C.

For further information about Martinique, see "Martinique, Caribbean Question Mark," in the January, 1941, issue of the *National Geographic Magazine*.

See also the following GEOGRAPHIC SCHOOL BULLETINS: "France-in-America Scattered over Wide Area," November 18, 1940, and "European Colonies Make Non-American Spots in the Americas," October 23, 1939.

**Bulletin No. 2, January 12, 1942.**

*Photograph by Ella Barnet*

**OX-PACED AGRICULTURE HAS EARNED MARTINIQUE A GOOD LIVING**

**The tropical fertility of the French island's volcanic soil has given abundant crops of sugar cane to Martinique's plantations, so that sugar and its by-product, rum, have supported a prosperous commerce with the homeland. Coffee and cocoa, bananas and pineapples are other tropical exports from the Caribbean island. Agriculture and trade are timed to the leisurely pace of the ox-cart, until very recently the only conveyance for farm produce; now the automobile and to a less extent the truck have appeared on Martinique roads.**

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## Wake Island, The New Watchword for Valor

THE epic battle of Japanese invaders and the garrison of U. S. Marines turned Wake Island into the "Alamo of the Pacific," a spot that has become a watchword for valor.

The stubborn and prolonged defense of the mid-Pacific island against overwhelming odds is a clue to Wake's value to the United States. This tiny speck of land is the vital halfway point between Hawaii and the United States naval station of Guam, which in turn is a stepping stone to Manila and the Philippines. The island has been a regular way-station on the Pan American Airways service across the Pacific since 1936.

### Nearest Neighbors Are Japanese Islands

Wake lies 2,300 miles due west of Honolulu and 1,520 miles northeast of Guam. To skip the Wake stop on the trip to Guam and the Philippines would necessitate a voyage or flight of many additional miles, unless some alternate stop could be obtained.

Wake's nearest neighbors are Japanese, the Taongi (Pokaakku) Islands 450 miles to the southeast, within the area mandated to Japan after World War I.

Wake Island is really triplets. The Wake coral atoll is shaped like an irregular V, with the tips of the V broken off. The main island, comprising most of the V, is Wake. The two tips are Wilkes Island and Peale Island.

The V opens to the northwest, with coral reefs extending across its mouth. The only natural entrance for boats into the lagoon within the V is the narrow passage between Wilkes and Wake Islands, through which small craft can sail at high tide without too much danger from the rough coral heads that dot the waters just off shore.

The triangular lagoon enclosed by the islands and their surrounding coral reef is shallow but spacious. Removal of the threatening coral heads has cleared its waters to permit safe landing of seaplanes. The waters of the lagoon teem with tropical fish.

### Wilkes Explored It Exactly a Century Ago

The three narrow islands, while extending through a watery area four miles wide, have a surface area of less than three square miles all together. Wake, the largest, has less than two square miles; Wilkes and Peale combine to add another three-quarters of a mile.

Generally sandy and low, they consist of pebbly white beaches and hummocks of coral rock. Nowhere do the islands rise more than 21 feet above sea level. Umbrella trees and heavy brush grow in the sand, and innumerable sea birds hollow out sandy nests in which they lay their eggs.

Wake Island was called Halcyon when first discovered in 1796. A British ship, the *Prince William Henry,* sailed past it and reported it to the map-makers. Thereafter it was lost for years. A tiny speck of land in such a vast expanse of ocean, the group was difficult to find in the days of sail and hit-or-miss navigation. For long it was believed that "Halcyon" had been engulfed by the Pacific. There are, indeed, some indications on Wake that the sea has at times washed completely over the island.

Charles Wilkes, commander of the famous United States Exploring Expedi-



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out of felt. Chemically treated rayon is used in belts, bracelets, and shoe heels.

A newer entry in the artificial textile field is nylon, made of air, water and coal. Already preferred for hosiery, it is now finding experimental uses in knitted and woven dress goods. United States 1940 production of about 8,000,000 pounds of nylon shortly will be doubled by the output of a new plant, just opened in Virginia. Nylon furnishes more than a fifth of all women's full-fashioned hosiery.

Wool is suffering competition not only from rayon, but also from fluffy casein fiber, made from the curds of skim milk. By next spring, many Americans will be wearing hats, dresses, slacks, or blouses with a goodly proportion of milk fiber in the fabric. In felt hats, casein fiber is replacing part of the rabbit fur. Casein also is finding its way into combs, beads, buttons, and umbrella handles.

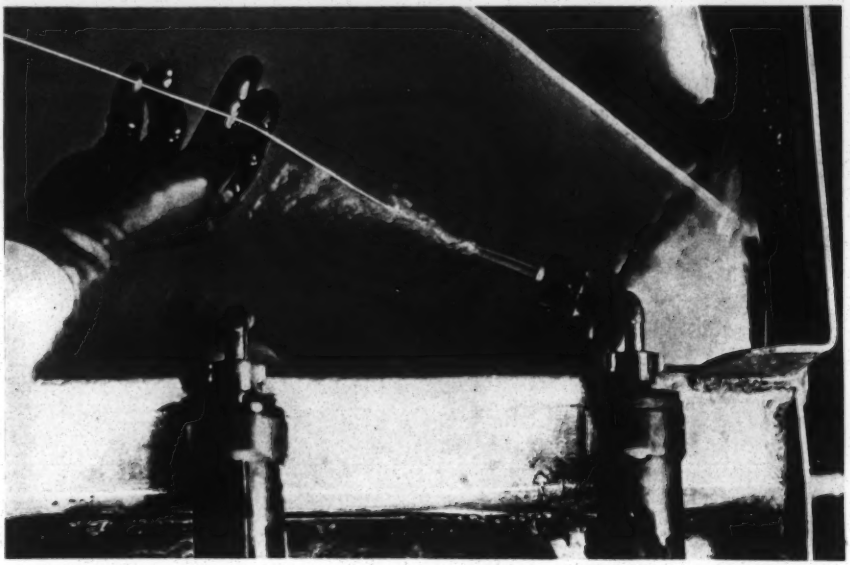
Plastics more and more are sweeping the field of clothing accessories. Among these are shoe lace tips, eyeglass frames, "zipper" fasteners, and costume jewelry.

Today's textiles would be sadly short of color if artificial dyes were not available. The test tube also has produced the chemical mixtures which make fabrics water-, moth-, and mildew-repellent, as well as flameproof.

The versatility of plastics in the field of clothing is illustrated strikingly by one family of plastics, technically called "vinyl esters." They appear to be a cross between paper and rubber. This plastic group finds uses in women's shoes, golf jackets, aprons, capes, raincoats, half-rubbers, in shower caps, umbrellas, key chains, and in cosmetic, shoe, and garment bags. Requiring no laundering but a wipe with a damp cloth, these plastics can be made hard as board or pliable as cloth.

Note: For further information about synthetic materials, see the *National Geographic Magazine* for November, 1939, for the article, "Chemists Make a New World."

**Bulletin No. 3, January 12, 1942.**



*Photograph from Du Pont Company*

**A MECHANICAL WORM SPINS ARTIFICIAL SILK IN THE RAYON PLANT**

**A pupil of Pasteur and a student of silkworms, Count Chardonnet observed the tiny holes through which the silkworm spouted the fluid that hardened into threads of silk. Then he invented the mechanical "spinneret" of platinum and gold, a disk with holes (light piece at tip of pipe, right) through which fluid cellulose is squirted to become rayon thread. Leaning over a tank and looking down, one sees the pipe (foreground) carrying syrupy cellulose to the spinneret at the tank's edge. Through fine holes in the spinneret the cellulose is forced under pressure into the chemical bath in the tank, where chemical action hardens the thin stream of fluid into a rayon thread. The gloved hand lifts the thread as it takes shape.**

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## Overloaded Hong Kong Was Vulnerable to Siege

THE fall of besieged Hong Kong for lack of water highlights that British Crown Colony's chief weakness: it is a small island, with "standing room only" for its crowded population.

To the million inhabitants of peacetime Hong Kong, war in China had added a million refugees. The mountainous little colony's barren slopes could not nourish its 5,000 people per square mile without importing food and, in rainless seasons, water. The Japanese siege, cutting transport arteries to the island, threatened the colony with starvation and thirst.

### War Brought Crowds That Hastened Capture

The colony's 390 square miles comprise the island of Hong Kong where the city of Victoria stands, the peninsula of Kowloon on the Chinese mainland across a narrow channel-harbor, and the "New Territories" on the mainland.

For more than a year the colony's direct connections with the interior have been severed by the Japanese, who have held China's coast, including Canton, the Pearl River, and the railroad which made Hong Kong south China's great port.

Destitute Chinese flocking for protection to Hong Kong have made the city perhaps more congested than any other part of densely populated China. Many poverty-stricken Chinese have been maintained in camps under British supervision. More than 100,000 live on junks and sampans in the harbor, and some 25,000 have their favorite sleeping nooks on the sidewalks. Hundreds of China's wealthiest citizens also had sought sanctuary in the colony.

### How the Island Colony Grew

Opium bootleggers, indirectly, started Britain's southeastern China colony of Hong Kong, 102 years ago. During the Opium War in 1840, British forces chased pirates and stonecutters off Hong Kong Island and occupied it.

Defeated China ceded the island's 32 square miles, an 11-mile-long crest of a half-drowned mountain ridge a quarter-mile off China's coast. Twenty years later Britain acquired also the Kowloon Peninsula of China's mainland across the quarter-mile channel.

A 99-year lease in 1898 added the strip of New Territories, which runs east and west from the root of Kowloon Peninsula to embrace a bay on each side.

On this tropical patch of Britain-abroad, almost halfway around the world from London, grew the chief British stronghold between Singapore and Shanghai. The Philippines lie 600 miles southeast. Singapore is 1,454 miles southwest.

Victoria, the modern mountainside city on the north shore of Hong Kong Island, is the colony's commercial heart. The single railroad from inside China and the main shipping lines from abroad, however, have their terminals on Kowloon Peninsula. In time of peace, international air lines make Hong Kong their terminus, including the Pan American line which once linked the colony to Manila and to San Francisco 6,800 miles east.

The colony's population is 98 per cent Chinese. In the limited rural district of New Territories carabaos plow small Chinese farms, and Chinese tend litchi orchards, herds of geese, and families of sway-backed pigs.

Note: For further information about Hong Kong, see the *National Geographic Magazine* for April, 1940, for the article, "1940 Paradox in Hong Kong."



UMI

tion of the mid-19th century, was probably the first human being to pay more than passing attention to Wake. He reported seeing it on December 20, 1841, and was evidently delighted that the so-called Halcyon Island was not forever lost. His name is still attached to one member of the island group.

It was a century later, almost exactly to the day, that the American forces holding the island were overwhelmed at last by Japanese attackers.

### Uninhabited Till Air Travel Brought Hotel

Under President McKinley, the United States took formal possession of Wake, on January 17, 1899, when it was visited by the *U. S. S. Bennington* under the command of Captain E. D. Taussig.

Since there is no fresh water on any of the three islands, Wake had no permanent inhabitants until recently. Japanese bird poachers are known to have visited it before the World War, but it was not settled until Pan American Airways established a base there for an air route stop-over on the series of hops across the Pacific.

An electric generator, a diminutive freight railroad, and a hotel complete with all furniture and fittings were shipped out from San Francisco and set up on the no-longer "desert island." Running water, electricity, and radio were soon made available.

Note: For further information about Wake Island, see the *National Geographic Magazine* for December, 1936, for the article, "Flying the Pacific."

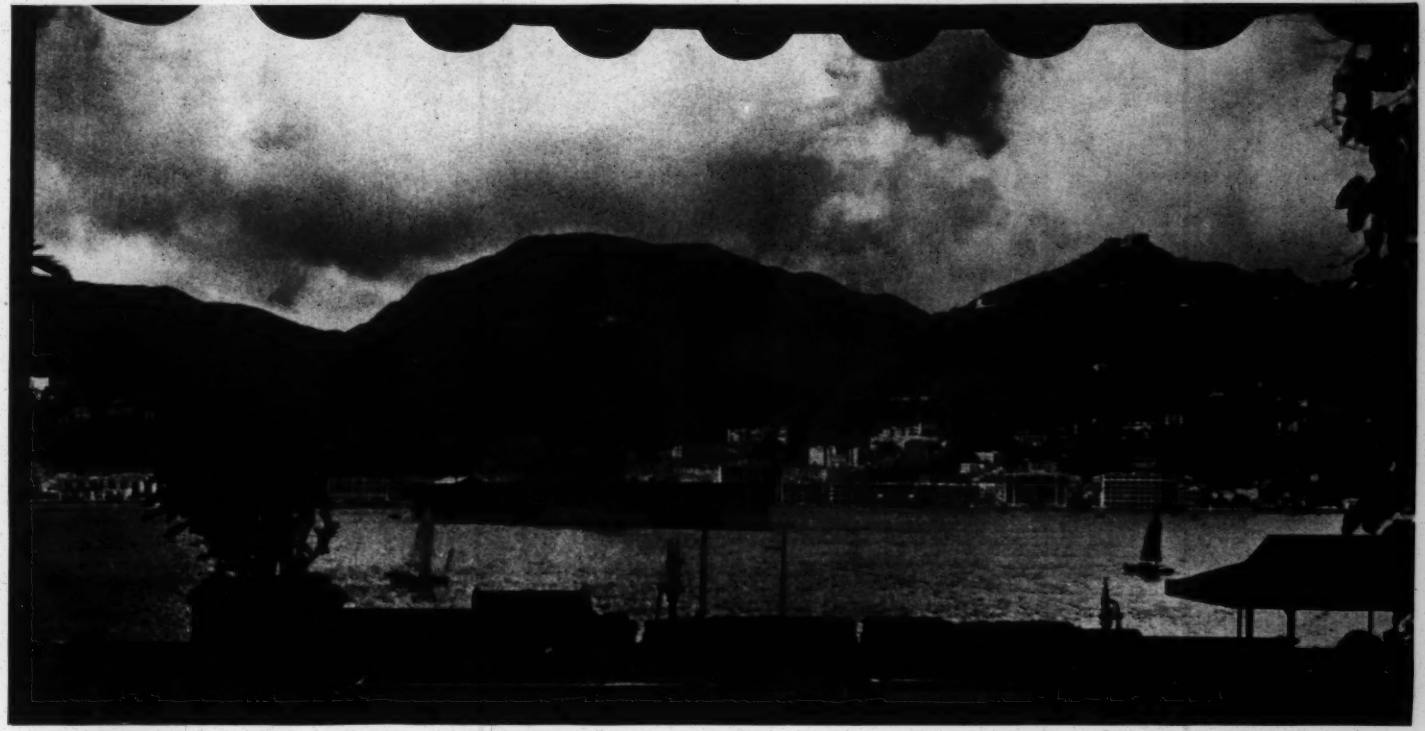
The island may be located on the National Geographic Society's Map of the Pacific, published as a supplement to the December, 1936, *Magazine*.

**Bulletin No. 4, January 12, 1942.**

*Photograph from Pan American Airways*

**AIR TRAVEL GAVE UNINHABITED WAKE A RAILROAD AND A HOTEL**

**With the exception of occasional Japanese bird poachers, the birds, hermit crabs, and rats held unchallenged possession of Wake Island until airways across the Pacific made it a way-station. Because the best landing place was some distance from the best site for a hotel, a small railroad was built to haul construction materials. Then the 45-room hotel rose on the coral sand, in the midst of umbrella trees and gnarled brushwood, to accommodate passengers of the *Clipper* planes on their overnight stop between Midway Island and Guam.**



*Photograph from Philip D. Gendreau*

**FROM CHINA'S MAINLAND, HONG KONG'S HULK IS CLEARLY VISIBLE**

**A narrow shoreline shelf around rocky Hong Kong Island holds most of the Westernized business and financial section of the city of Victoria. Fortifications crown the Peak (right background) and other heights above the city. That the island is incapable of producing food for two million people is apparent from the rugged nature of the rocky slopes. The channel which separates Hong Kong from the mainland peninsula of Kowloon, where this photograph was made from a hotel window, gives anchorage to warships, freighters, and ocean liners from the other great ports of the world. In the foreground is the railroad that links Kowloon's docks with Canton and China's interior, carrying more than fifty million tons of shipping a year in normal times.**